

This listing of claims will replace all prior versions and listings of claims in this application:

a.) Listing of Claims

1. (Canceled)
2. (Currently Amended) The method of Claim 37, wherein the non-oxidizing atmosphere of Ar comprises less than 1% of a residual amount of N₂, N₂O₅, O₂ or CO₂.
3. (Currently Amended) The method of Claim 37, wherein the core comprises up to 45% wt of a metal powder and wherein an iron powder comprises up to 44% wt of the core composition.
- 4-36. (Canceled)
37. (Currently Amended) A method for gas-metal arc welding of ferrous alloys comprising:
feeding a consumable metal-core electrode into a gas-metal arc welding apparatus,
the metal-core electrode having a sheath and a core characterized by a core composition:
using Ar to form a non-oxidizing shielding atmosphere around the consumable metal-
core electrode; and
igniting an arc between a ferrous alloy work piece and the consumable metal-core
electrode to weld a carbon steel, low alloy steel or ferritic stainless steel work piece in the
non-oxidizing shielding gas atmosphere; and
The method of Claim 1 further comprising producing a weld metal comprising a percentage of oxygen in the weld metal not exceeding 0.06% wt.
38. (Previously presented) The method of Claim 37, wherein the core composition of the metal-core wire comprises oxygen.

39. (Currently Amended) ~~The method of Claim 1, in which~~ A method for gas-metal arc welding of ferrous alloys comprising:

feeding a consumable metal-core electrode into a gas-metal arc welding apparatus,
the metal-core electrode having a sheath and a core characterized by a core composition;
using Ar to form a non-oxidizing shielding atmosphere around the consumable metal-
core electrode; and
igniting an arc between a ferrous alloy work piece and the consumable metal-core electrode
to weld a carbon steel, low alloy steel or ferritic stainless steel work piece in the non-
oxidizing shielding gas atmosphere, wherein a fume generation rate does not exceed 0.25
gms/min.

40. (Currently Amended) ~~The method of Claim 1~~

A method for gas-metal arc welding of ferrous alloys comprising:

feeding a consumable metal-core electrode into a gas-metal arc welding apparatus,
the metal-core electrode having a sheath and a core characterized by a core composition;
using Ar to form a non-oxidizing shielding atmosphere around the consumable metal-
core electrode; and
igniting an arc between a ferrous alloy work piece and the consumable metal-core electrode
to weld a carbon steel, low alloy steel or ferritic stainless steel work piece in the non-
oxidizing shielding gas atmosphere, wherein stability of the arc is characterized by a standard
deviation within the range from about 0.2 V to about 0.3 V.

41. (Currently Amended) ~~The method of Claim 1~~

A method for gas-metal arc welding of ferrous alloys comprising:

feeding a consumable metal-core electrode into a gas-metal arc welding apparatus,
the metal-core electrode having a sheath and a core characterized by a core composition;
using Ar to form a non-oxidizing shielding atmosphere around the consumable metal-
core electrode; and
igniting an arc between a ferrous alloy work piece and the consumable metal-core electrode
to weld a carbon steel, low alloy steel or ferritic stainless steel work piece in the non-

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oxidizing shielding gas atmosphere, wherein a toughness of a weld metal at 0 F of at least about 50 ft-lb at 0° F and at least about 41 ft-lb at -20° F.